Low Power Circuits with Small Voltage Swing Transmission, Voltage Regeneration, and Wide Bandwidth Architecture

ABSTRACT OF THE INVENTION

An integrated circuit, such as a memory macro, includes multiple power rails supporting first and second voltage differentials, with the second voltage differential being smaller than the first voltage differential. Signal lines in the integrated circuit are driven with the small voltage swing, which is generated by small swing circuits. The integrated circuit further includes regeneration circuits, which are receiving small voltage swing inputs and are outputting first, or full voltage swings. The application of the small voltage swing to the signal lines saves power in the integrated circuit. A wide bandwidth, full-wordline I/O, memory integrated circuit has simultaneously operable connection paths between essentially all the memory cells that are attached to the same wordline and the corresponding I/O terminals, and it has a single ended data-line structure.